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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,869	01/16/2004	Nusrallah Jubran	3216.63US01	8013

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MINNEAPOLIS, MN 55402-2100

EXAMINER
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NOTE, JANIS L

ART UNIT	PAPER NUMBER
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1756

MAIL DATE	DELIVERY MODE
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05/24/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/758,869		JUBRAN ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Janis L. Dote		1756	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 October 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 and 26-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 26-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/20/04; 6/5/06</u> . | 6) <input type="checkbox"/> Other: _____  |

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1. Applicants' election of the invention in Group I, claims 1-16 and 26-30, in the reply filed on Oct. 13, 2006, is acknowledged. Because applicants did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2. The examiner acknowledges the cancellation of claims 17-25 and 31-41 filed on Oct. 13, 2006. Claims 1-16 and 26-30 are pending.

3. The abstract of the disclosure is objected to because it is not limited to a single paragraph. Correction is required. See MPEP § 608.01(b).

Applicants are reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure

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concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

4. The disclosure is objected to because of the following informalities:

(1) The specification discloses that one or more of the methylene groups in the  $-(CH_2)_m-$  group can be replaced by N, C, B, P, or a "CR<sub>4</sub>." See the specification, page 3, lines 26-29, page 5, lines 7-10, page 10, lines 11-14, and page 23, lines 25-28. However, it is not clear how a methylene group, which is divalent, can be replaced with groups that are not divalent.

(2) The specification further discloses that one or more of the methylene groups in the  $-(CH_2)_m-$  group can be replaced by a NR<sub>3</sub> group, a "CR<sub>4</sub>" group, or a CR<sub>5</sub>R<sub>6</sub> group, where the R groups can be a bond. See the specification, page 3, line 29, page 5, line 10, page 10, line 14, and page 23, line 28. However, it is not clear with what the R bonds form a bond.

(3) The specification discloses that one or more of the methylene groups in the  $-(CH_2)_m-$  group can be replaced by a NR<sub>3</sub> group, a "CR<sub>4</sub>" group, or a CR<sub>5</sub>R<sub>6</sub> group, where the R groups can be part of a ring group. See the specification, page 4, line 2, page 5, line 12, page 10, line 16, and page 23, line 30.

However, it is not clear what is meant by the term "part of a ring group." The specification does not define said group.

(4) The use of trademarks, e.g., Calgon [sic: CALGON] at page 13, line 22, has been noted in this application. The trademarks should be capitalized wherever they appear and be accompanied by the generic terminology. This example is not exhaustive. Applicants should review the entire specification for compliance.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner, which might adversely affect their validity as trademarks.

(5) The instant specification references serial US applications by their serial numbers, but does not provide the current status of said applications. For example, US application 10/425,333, filed on Apr. 28, 2003, at page 15, line 13, and US application 10/396,536, filed on Mar. 25, 2003, at page 22, line 12. This listing of US applications is not exhaustive. Applicants are requested to provide the current statuses of all of the US applications disclosed in the instant specification, and to update the status in each response in the future.

Appropriate correction is required.

5. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

In claims 4, 12, and 29, the recitation "E<sub>1</sub> and E<sub>2</sub> are, each independently, an oxiranyl ring" lacks antecedent basis in the specification.

In claims 5, 13, and 30, the formula recited in those claims lacks antecedent basis in the specification. See page 24, line 8, of the specification, which discloses the charge transport materials having the structures shown in formulas (2) and (3). The carbazolyl moieties in formulas (2) and (3) are either unsubstituted or substituted at the 6-position with a chlorine atom. The formula recited in claims 5, 13, and 30 is broader than the two particular formulas (2) and (3) because the R groups on the carbazolyl moieties are not limited to be hydrogen atoms or chlorine atoms at the 6-position.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-16 and 26-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Instant claims 1, 9, and 26 are indefinite in the phrase "X<sub>1</sub> and X<sub>2</sub> . . . have the formula -(CH<sub>2</sub>)<sub>m</sub>- group, branched or linear, where m is an integer between 0 and 20, inclusive" (emphasis added), because it is not clear how the -(CH<sub>2</sub>)<sub>m</sub>- group can be branched. Branching in an aliphatic carbon chain requires, for example, at least a -(CHR)- group, where R is an alkyl group.

Instant claims 1, 9, and 26 are further indefinite in the phrase "one or more of the methylene groups [in the formula -(CH<sub>2</sub>)<sub>m</sub>- group] is optionally replaced by a . . . N, C, B, P, . . . a CR<sub>4</sub> . . ." because it is not clear how a methylene group, which is divalent, can be replaced with groups that are not divalent.

Instant claims 1, 9, and 26 are also indefinite in the phrase "one or more of the methylene groups [in the formula -(CH<sub>2</sub>)<sub>m</sub>- group] is optionally replaced by . . . an NR<sub>3</sub> group, a

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CR<sub>4</sub> group, or a CR<sub>5</sub>R<sub>6</sub> group" where the R groups can be "a bond" because it is not clear with what the R bonds form a bond.

Instant claims 1, 9, and 26 are further indefinite in the phrase "one or more of the methylene groups [in the formula -(CH<sub>2</sub>)<sub>m</sub>- group] is optionally replaced by . . . an NR<sub>3</sub> group, a CR<sub>4</sub> group, or a CR<sub>5</sub>R<sub>6</sub> group" where the R groups can be "part of a ring" because it is not clear what is meant by the term "part of a ring group." The instant specification does not define said group.

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.



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9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

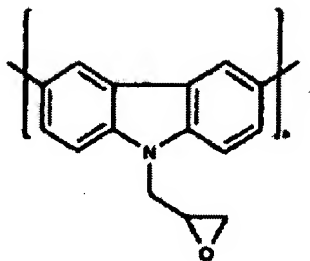
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f), or (g) prior art under 35 U.S.C. 103(a).

11. Claims 26-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Bouguettaya, et al., Journal of Applied Polymer Science, Vol. 73 (1999), pp. 1483-1492 (Bouguettaya), as evidenced by applicants' admissions at page 11, lines 5 and 10-12, and page 11, line 31, to page 12 line 16, of the instant specification (applicants' admission I).

Bouguettaya discloses the compound poly(N-glycidyl carbazole)

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where n is an integer of more than one. See page 1490, line 1.

The compound is within the compositional limitations of the formula recited in the instant claims, in particular the formula recited in instant claim 30. The compound is represented by the formula recited in instant claim 30, when n is more than one and the R groups are "heterocyclic groups." The instant specification at page 11, lines 5 and 10-12, discloses that the term "heterocyclic group" can include carbazoyl and "may also include any combinations of the above aromatic heterocyclic groups bonded together either by a bond (as in bicarbazoyl) . . . ." The instant specification at page 11, line 31, to page 12, line 16, discloses that the term "'group' indicates that the generically recited chemical moiety (e.g., alkyl group . . . ) may have any substituent thereon which is consistent with the bond structure of that group. For example, when the term 'alkyl group', such as methyl, ethyl . . . but also substituents such as hydroxyethyl . . . and the like . . .

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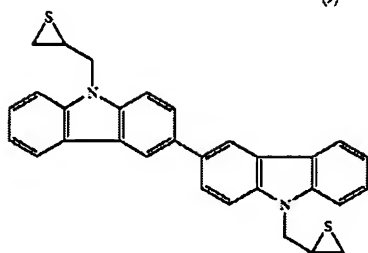
No substitution would be included within the term that would alter the fundamental bond structure of the underlying group." Thus, the term "heterocyclic group" appears to read on "carbazolyl groups" substituted by other carbazolyl groups.

Bouguettaya does not identify its compound as a charge transport material as recited in the instant claims. However, as discussed above, the reference compound meets the compositional limitations recited in the instant claims. Thus, it is reasonable to presume that the reference compound has charge transporting properties. The burden is on applicants to prove otherwise. In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

12. Claims 26-30 are rejected under 35 U.S.C. 102(e) as being anticipated by US 7,014,968 B2 (Tokarski)

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Tokarski discloses making charge transport material represented by compound 9 of the formula



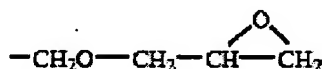
See col. 18, compound 9, and col. 24, line 35, to col. 25, line 47. According to Tokarski, compound 9 is formed by reacting the epoxy analog of compound 9 with ammonium thiocyanate. Col. 19, lines 36-37 and 43-47; and col. 25, lines 41-46. In other words, compound 9 is formed by replacing the oxygen atoms in its epoxy analog with sulfur atoms. The epoxy analog of compound 9 meets the compositional limitations of the formulas recited in instant claims 26-30.

Tokarski does not identify the epoxy analog of compound 9 as a charge transport material as recited in the instant claims. However, as discussed above, the epoxy analog compound meets the compositional limitations recited in the instant claims. Thus, it is reasonable to presume that the epoxy analog compound has charge transporting properties. The burden is on applicants to prove otherwise. Fitzgerald, supra.

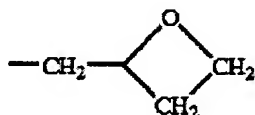
13. Claims 26, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,416,915 B1 (Kikuchi).

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Kikuchi discloses the compounds 31 and 32 at cols. 19-22. The compounds 31 and 32 comprise two chain-polymerization groups  $-\text{CH}_2\text{O}-\text{C}(\text{O})-\text{CH}=\text{CH}_2$ . Kikuchi teaches that the chain-polymerization functional groups can equally be the chain-polymerization functional group



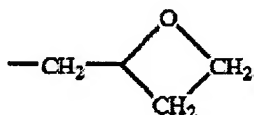
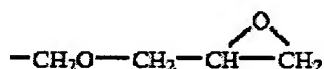
Col. 6, line 16, and compound 29 at cols. 19-20. Kikuchi teaches that the chain-polymerization functional group can also equally be the chain-polymerization group



Col. 6, line 30, and compound 23 at cols. 17-18. Kikuchi discloses that said hole transporting compound comprising at least two chain polymerization functional groups, i.e., compounds 23, 29, 31, or 32, forms a polymerizate. According to Kikuchi, when a surface layer in an electrophotographic photoreceptor comprises said polymerizate, the photoreceptor has high film strength leading to improved anti-abrasion and anti-scar characteristics. Col. 2, lines 52-56, and col. 3, lines 5-23.

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It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Kikuchi, to substitute the two chain polymerization functional groups  $-\text{CH}_2\text{O}-\text{C}(\text{O})-\text{CH}=\text{CH}_2$  in the Kikuchi compounds 31 or 32 with the equivalent chain polymerization functional groups



or

. That person would

have had a reasonable expectation of successfully obtaining a hole transporting compound comprising at least two chain polymerization function groups that is capable of forming a polymerize which when used in the surface of an electrophotographic photoreceptor improves the anti-abrasion and anti-scar characteristics of the photoreceptor.

The resulting hole transporting compounds comprising at least two chain polymerization function groups that are rendered obvious over the teachings of Kikuchi meet the compositional limitations of the formula recited in instant claims 26, 28, and 29. The resulting compounds comprising the oxiranyl groups are represented by the formula recited in instant claims 26 and 29, when Z is an aromatic group, E<sub>1</sub> and E<sub>2</sub> are oxiranyl, and X<sub>1</sub> and X<sub>2</sub> are  $-\text{CH}_2\text{OCH}_2-$ . The resulting compounds comprising the epoxy groups are represented by the formula recited in instant

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claims 26 and 28, when Z is an aromatic group and X<sub>1</sub> and X<sub>2</sub> are -CH<sub>2</sub>-.

14. Claims 1-16 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

The prior art of record does not teach or suggest an organophotoreceptor comprising the charge transport material as recited in the instant claims 1-16.

Bouguettaya discloses a compound that meets the compositional limitations of the formula recited in instant claims 1-5 and 9-12. See paragraph 11, supra. However, Bouguettaya does not disclose or suggest that said compound can be used as a charge transport compound in an organophotoreceptor. Rather, Bouguettaya teaches that the compound poly(N-glycidyl carbazole) is a crosslinkage polymer, which is used to form conductive adhesives. Page 1483.

Tokarski discloses a compound that meets the compositional limitations of the formula recited in instant claims 1-5 and 9-12. See paragraph 12, supra. However, Tokarski does not disclose or suggest that said compound can be used as a charge transport compound in an organophotoreceptor. Rather, Tokarski teaches that said compound is an intermediate product that is

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used to obtain its thiranyl containing compound 9.

Kikuchi renders obvious compounds that meet the compositional limitations of the formula recited in instant claims 1, 3, 4, 9, 11, and 12. See paragraph 13, supra.

However, as discussed in paragraph 13 above, Kikuchi discloses a surface layer comprising the polymerizate of said compound.

Thus, the resulting polymerizate in the photoreceptor would not comprise the compound of the formula recited in the instant claims.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (571) 272-1382. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Mark Huff, can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry regarding papers not received regarding this communication or earlier communications should be directed to Supervisory Application Examiner Ms. Claudia Sullivan, whose telephone number is (571) 272-1052.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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*Janis L. Dote*  
JANIS L. DOTE  
PRIMARY EXAMINER  
GROUP ~~1500~~  
1700

JLD

May 17, 2007